

In the Claims:

1. (Previously Presented) A hybrid MOS-bipolar device comprising:
a MOS device having a source, a trench gate, a drain and a body, the gate and the body being shorted together and biased positively relative to the drain; and
a bipolar device having an emitter, a collector, a base and a gate, wherein the gate of the bipolar device is the trench gate of the MOS device.
2. (Previously Presented) The hybrid MOS-bipolar device of claim 1, further comprising a substrate and a gate oxide that insulates the trench gate from the substrate, the gate oxide having a single oxide thickness of under 600Å.
3. (Previously Presented) The hybrid MOS-bipolar device of claim 1, further comprising a substrate that includes a PI region and an N drift region, the trench gate extending from a top surface of the substrate through the PI region into the N drift region, and a gate oxide that insulates the trench gate from the substrate, the gate oxide having a first thickness in a region adjacent the N drift region and having a second thickness adjacent the PI regions, the first thickness being greater than the second thickness.
4. (Previously Presented) The hybrid MOS-bipolar device of claim 2, wherein the trench gate has a square trench geometry as viewed from a top surface of the substrate.
5. (Previously Presented) The hybrid MOS-bipolar device of claim 2, wherein the trench gate has a circular geometry as viewed from a top surface of the substrate.
6. (Withdrawn) A method of implementing a hybrid MOS-bipolar device that includes a trench MOS device having a source, a body and a gate, comprising shorting together the body and the gate and positively biasing an electrode connected to the shorted body and gate.

7. (Withdrawn) The method of claim 6 wherein the trench MOS device includes a gate oxide having a thickness that varies along the length thereof.
8. (Withdrawn) The method of claim 7 wherein the gate oxide thickness varies by having two substantially discrete levels of thickness.
9. (Withdrawn) The method of claim 8 wherein said hybrid MOS-bipolar device has a PI region and an Ndrift region, and wherein the gate oxide has a first gate oxide thickness adjacent said PI region and a second and thicker gate oxide thickness adjacent said Ndrift region.
10. (Withdrawn) A hybrid MOS-bipolar device comprising a PI region, an Ndrift region, a body, a gate, a drain and a source, said device being configured with its body and gate shorted together, said device including a gate oxide having a thickness of a first value adjacent said PI region and having a thickness of a second value adjacent said Ndrift region.
11. (Withdrawn) The hybrid MOS bipolar device of claim 10, wherein said gate and said body are positively biased.
12. (Withdrawn) A method of making a hybrid MOS-bipolar device comprising doping a PI region to optimize said region for said MOS device, and fabricating a gate electrode to optimize a bipolar component of said hybrid MOS-bipolar device.
13. (Withdrawn) The method of claim 12 further comprising making a gate oxide having a thickness that varies along the length thereof.
14. (Withdrawn) The method of claim 13 wherein said gate oxide thickness is greater in a region adjacent said PI region than it is in a region adjacent said Ndrift region.

15. (Withdrawn) The method of claim 14 wherein said device is constructed using a double metal process flow.
16. (Withdrawn) A hybrid bipolar-MOS device comprising a first region serving as a source and an emitter, a second region serving as a body and a base, and a third region serving as a gate, the gate and the body being shorted together and positively biased.
17. (Withdrawn) The hybrid bipolar-MOS device of claim 16 further comprising a fourth region that serves as both a drain and a collector.
18. (Withdrawn) The hybrid bipolar-MOS device of claim 17 wherein the device has a breakdown voltage of approximately 200 volts.
19. (Withdrawn) The hybrid bipolar-MOS device of claim 17 further comprising a gate oxide having a single thickness of approximately 380-600 Angstroms.
20. (Withdrawn) The hybrid bipolar-MOS device of claim 17 further comprising a gate oxide having a plurality of thicknesses.
21. (Withdrawn) The hybrid MOS-bipolar device of claim 2 having a stripe geometry.
22. (Previously Presented) A hybrid MOS-bipolar device comprising:
a MOS device having a trench gate, a source, a drain and a body, the trench gate and the body being shorted together and biased positively relative to the drain;
a bipolar device having an emitter, a collector, a base and a gate formed by the trench gate, the emitter and the source being formed by a common region, the base and the body being formed by a common region, and the collector and the drain being formed by a common region;

a substrate that includes a PI region and an N drift region, the trench gate extending from a top surface of the substrate through the PI region into the N drift region;
a first electrode coupled to the trench gate, the body and the base; and
a second electrode coupled to the source and the emitter.

23. (Previously Presented) The device of claim 22, further comprising a gate oxide that insulates the trench gate from the substrate, the gate oxide having a first thickness in a region adjacent the N drift region and having a second thickness adjacent the PI regions, the first thickness being greater than the second thickness.

24. (Previously Presented) The device of claim 22, further comprising a third electrode coupled to the drain and collector, the third electrode located on a bottom surface of the substrate.

25. (Previously Presented) The hybrid bipolar-MOS device of claim 22, wherein the device has a breakdown voltage of approximately 200 volts.

26. (Previously Presented) The hybrid bipolar-MOS device of claim 22, further comprising a gate oxide that insulates the trench gate from the substrate, the gate oxide having a single thickness of approximately 380-600 Angstroms.

27. (Previously Presented) The hybrid bipolar-MOS device of claim 22, wherein the device is configured to function as both a MOS device and a bipolar device in parallel.

28. (Previously Presented) The hybrid bipolar-MOS device of claim 1, wherein the emitter and the source are formed by a common region, the base and the body are formed by a common region, and the collector and the drain are formed by a common region.

29. (Previously Presented) The device of claim 1, further comprising:

a substrate that includes a PI region and an N drift region, the trench gate extending from a top surface of the substrate through the PI region into the N drift region;
a first electrode coupled to the trench gate, the body and the base;
a second electrode coupled to the source and the emitter; and
a third electrode coupled to the drain and collector, the third electrode located on a bottom surface of the substrate.

30. (Previously Presented) The hybrid bipolar-MOS device of claim 1, wherein the device has a breakdown voltage of approximately 200 volts.

31. (Previously Presented) The hybrid bipolar-MOS device of claim 1, wherein the device is configured to function as both a MOS device and a bipolar device in parallel.

32. (New) The hybrid bipolar-MOS device of claim 1, further including an electrode that shorts the gate and body together and that is configured to forward bias the gate and body to operate the source as an emitter and the body as a base of the bipolar device.

33. (New) The hybrid bipolar-MOS device of claim 1, further including an electrode that shorts the gate and body together and that is configured to

forward bias the gate and body to operate the source as an emitter and the body as a base of the bipolar device, and

form a MOS channel along a sidewall of a trench in which the trench gate is formed, to pass current from the source/emitter to the base/body.

34. (New) The hybrid MOS-bipolar device of claim 22, wherein the first electrode shorts the gate and body together and is configured to forward bias the gate and body to operate the source as an emitter and the body as a base of the bipolar device.

35. (New) The hybrid MOS-bipolar device of claim 22, wherein the first electrode shorts the gate and body together and is configured to

forward bias the gate and body to operate the source as an emitter and the body as a base of the bipolar device, and

form a MOS channel along a sidewall of a trench in which the trench gate is formed, to pass current from the source/emitter to the base/body.